Application No.: 10/050186
Docket No.: FO6069USNA

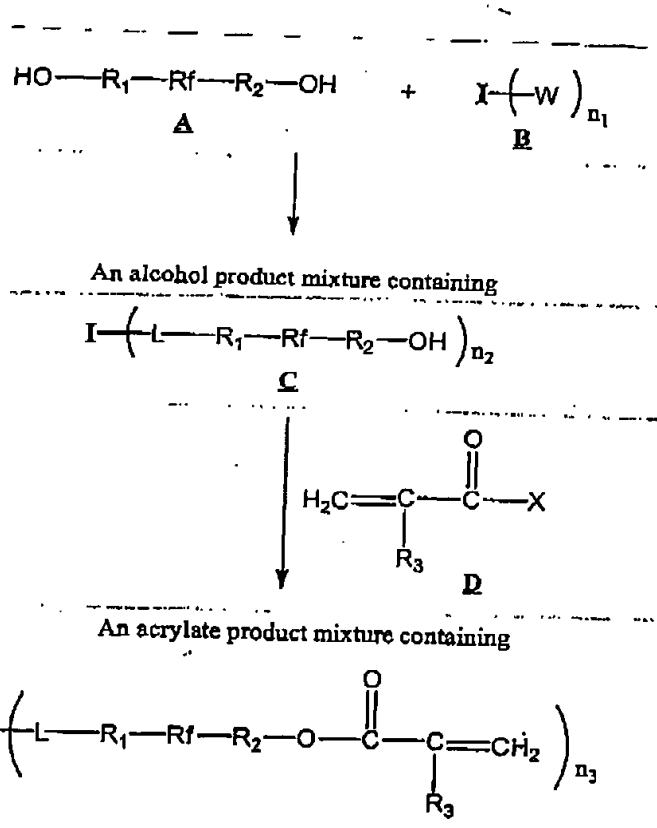
AMENDED CLAIMS

1. Cancelled

2. Cancelled

3. (Currently amended) The photosensitive composition of ~~Claim 2~~ Claim 4 wherein n, (1=1-3) independently ranges from 3 to 6.

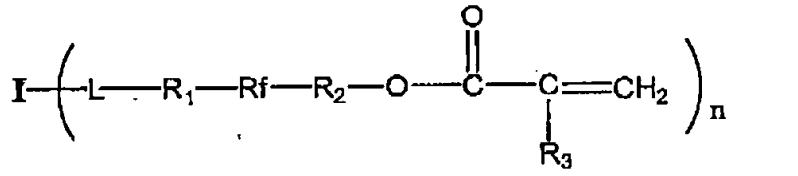
4. (Currently amended) ~~The photosensitive composition of Claim 2~~ A photosensitive composition comprising a) at least one fluorinated non-urethane containing multifunctional acrylate prepared from at least one multifunctional alcohol, said alcohol being synthesized from a core molecule having at least two equivalents of hydroxy-reacting functional groups and a fluorinated molecular having at least two hydroxyl groups; and b) at least one initiator, wherein the non-urethane containing multifunctional acrylate is prepared using the following reaction scheme:



wherein A is a fluorinated monomer or polymer having two hydroxyl groups, wherein RF is a monomeric or polymeric perfluorinated alkylenediyl, alkylene oxide, arylenediyl, arylene oxide, and mixtures thereof, and R_1 and R_2 are monomeric or polymeric divalent moieties such as alkylenediyl, alkylene oxide, alkylene sulfide, arylenediyl, arylene oxide, arylene sulfide, siloxane and mixtures thereof; **B** is a multifunctional molecule wherein **I** is a multivalent radical, W stands for one equivalent of hydroxy-reacting functional group and n_1 is at least 2; **C** is the multifunctional alcohol product mixture from **A** and **B**, wherein L is an ether or ester link and n_2 is at least 2; **D** is an acryloylation agent, wherein X is selected from OH, Cl and alkoxy; and **E** is the acrylate product mixture from **C** and **D**, wherein R_3 is H or CH_3 and n_3 is at least 2, wherein there are at least 2.5 equivalents of OH groups from **A** for every equivalent of hydroxy-reacting group, W, from **B**.

5. (Currently amended) The photosensitive composition of ~~Claim 2~~, Claim 4 wherein L is an ester link.

6. (Currently amended) The photosensitive composition of ~~Claim 2~~, Claim 4 wherein the acrylate **E** has the formula of:



wherein n ranges from 3 to 6.

7. (Currently amended) The photosensitive composition of ~~Claim 2~~, Claim 4 wherein Rf is a perfluorinated poly (methylene) moiety having at least 4 carbon atoms.

8. (Currently amended) The photosensitive composition of ~~Claim 2~~, Claim 4 wherein Rf is a perfluorinated poly (alkylene oxide) moiety having at least 4 carbon atoms.

9. (Currently amended) The photosensitive composition of ~~Claim 2~~, Claim 4 wherein **B** is selected from a group consisting of multifunctional carboxylic acid, acid chloride, ester and anhydride.

10. (Currently amended) The photosensitive composition of ~~Claim 2~~, Claim 4 wherein **B** is selected from 1,3,5-benzenetricarbonyl trichloride, trimethyl-1,3,5-benzenetricarboxylate and 1,2,4-benzenetricarboxylic acid.

11. (Currently amended) The photosensitive composition of ~~Claim 2~~, Claim 4 wherein **B** is selected from 1,2,3,4-butanetetracarboxylic acid and tetraethylrimethyl-1,1,2,2-ethanetetracarboxylate.

12. (Currently amended) The photosensitive composition of ~~Claim 1~~, Claim 4 wherein the acrylate has a number average molecular weight of at least 500.

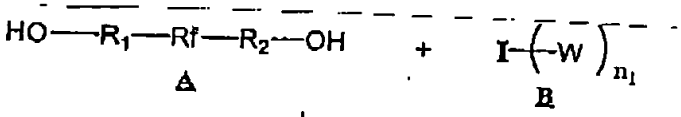
13. (Currently amended) ~~The photosensitive composition Claim 1~~ A photosensitive composition comprising a) at least one fluorinated non-urethane containing multifunctional acrylate prepared from at least one multifunctional alcohol, said alcohol being synthesized from a core molecule having at least two equivalents of hydroxyl-reacting functional groups and a fluorinated molecular having at least two hydroxyl groups; and b) at least one initiator wherein the photoinitiator composition is a mixture of at least two different photoinitiators.

14. (Withdrawn) A waveguide device having a light-transmitting structure formed on a substrate by patterning the photosensitive composition comprising:

a) at least one fluorinated, non-urethane containing multifunctional acrylate prepared from at least one multifunctional alcohol, said alcohol being synthesized from a core molecule having at least two equivalents of hydroxy-reacting functional groups and a fluorinated molecule having at least two hydroxyl groups; and

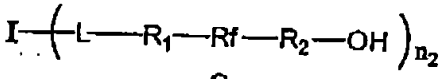
b) at least one photoinitiator.

15. (Withdrawn) The waveguide device of Claim 14 wherein the multifunctional acrylate is prepared using the following reaction scheme:

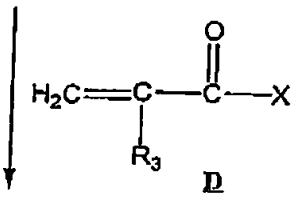


A + B

An alcohol product mixture containing

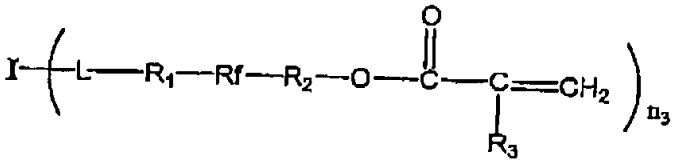


C



D

An acrylate product mixture containing



E

Wherein A is a fluorinated monomer or polymer having two hydroxyl groups, wherein Rf is a monomeric or polymeric perfluorinated alkylenediyl, alkylene oxide, arylenediyl, arylene oxide, and mixtures thereof, and R_1 and R_2 are monomeric or polymeric divalent moieties such as alkylenediyl, alkylene oxide, alkylene sulfide, arylenediyl, arylene oxide, arylene sulfide, siloxane and mixtures thereof; **B** is a multifunctional molecule wherein **I** is a multivalent radical, W stands for one equivalent of hydroxy-reacting functional group and n_1 is at least 2; **C** is the multifunctional alcohol product mixture from **A** and **B**, wherein L is an ether or ester link and n_2 is at least 2; **D** is an acryloylation agent, wherein X is selected from

OH, Cl and alkoxy; and **E** is the acrylate product mixture from **C** and **D**, wherein R_3 is H or CH_3 and n_3 is at least 2.

16. (Withdrawn) The waveguide device of Claim 14, wherein the waveguide structure is patterned with an actinic radiation.

17. (Withdrawn) The waveguide device of Claim 14, wherein the waveguide structure is patterned with reactive ion etching (RIE).

18. (Withdrawn) A thermo-optic device comprising a waveguide structure of Claim 14 and at least one resistive heater.

19. (Withdrawn) The waveguide device of Claim 14 wherein said waveguide structure containing at least one optical grating element.

20. (Withdrawn) The waveguide device of Claim 19 wherein said device comprising at least one resistive heater.

21. (Withdrawn) A method to produce a waveguide device having a light-transmitting structure formed on a substrate by forming a coating of a photosensitive composition on a substrate and patterning the coating with an actinic radiation, said composition comprising:

a) at least one fluorinated, non-urethane containing multifunctional acrylate prepared from at least one multifunctional alcohol, said alcohol being synthesized from a core molecule having at least two equivalents of hydroxy-reacting functional groups and a fluorinated molecule having at least two hydroxyl groups; and

b) at least one photoinitiator.

22. (Withdrawn) A method to produce a waveguide device having a light-transmitting structure formed on a substrate comprising:

a) coating a layer of a first composition of at least one fluorinated, non-urethane containing multifunctional acrylate prepared from at least one multifunctional alcohol, said alcohol being synthesized from a core molecule having at least two equivalents of hydroxy-

reacting functional groups and a fluorinated molecule having at least two hydroxyl groups; and at least one photoinitiator on a substrate and exposing the layer to an actinic radiation to form a bottom cladding layer with a first refractive index, n_1;

b) coating a thin layer of a second composition of at least one fluorinated, non-urethane containing multifunctional acrylate prepared from at least one multifunctional alcohol, said alcohol being synthesized from a core molecule having at least two equivalents of hydroxy-reacting functional groups and a fluorinated molecule having at least two hydroxyl groups; and at least one photoinitiator on top of the bottom cladding layer and patternwise exposing the thin layer to an actinic radiation through a photomask with a desired feature to form a latent image in a core layer;

c) removing the non-exposed portions in the core layer with an organic solvent to form a waveguide rib with a second refractive index, n_2, wherein n_2 is greater than n_1; and

d) coating a thin layer of a third composition of at least one fluorinated, non-urethane containing multifunctional acrylate prepared from at least one multifunctional alcohol, said alcohol being synthesized from a core molecule having at least two equivalents of hydroxy-reacting functional groups and a fluorinated molecule having at least two hydroxyl groups; at least one photoinitiator on top of the core layer and the bottom cladding layer and exposing the layer of the third composition to an actinic radiation to form a top cladding layer with a third refractive index, n_3, wherein n_3 is less than n_2.

23. (Withdrawn) A waveguide device fabricated using the method of Claim 22.

24. (Withdrawn) The waveguide device of Claim 23, wherein $n_1 = n_3$.